



for Percy

with Dr. Fletcher's Compliments



CASES OF

MALFORMATION OF THE HEART.

By T. B. E. FLETCHER, M.D.,

PHYSICIAN TO THE GENERAL DISPENSARY, BIRMINGHAM.

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COMMUNICATED BY RICHARD PARTRIDGE, Esq., F.R.S., &c.

READ MAY 24TH, 1842.

IN the belief that the following cases of malformation of the heart are of sufficient importance to attract the notice of the Fellows of the Royal Medical and Chirurgical Society, I beg leave to bring them, together with preparations and drawings of the anormal parts, before the meeting.

The first is a case of aneurism and dilatation of the pulmonary artery, together with malformation of the heart and arteries, of which I shall proceed to give, first, a sketch of the case, then a description of the parts as they appeared at the *post-mortem* examination of the body, and, as opportunity offers, venture upon a few remarks, which, I think, may be useful in assisting others, who may meet with similar cases, in arriving at a correct diagnosis of the disease.

On the 24th of August 1839, Mary Bunn, aged 19 years, a worker in a screw manufactory, of very spare habit, and exsanguinous appearance, presented herself to me as a patient at the Birmingham

General Dispensary. She stated that up to the age of sixteen she enjoyed tolerably good health, except that she had always a slight hacking cough, from which she never suffered particularly, and that previously to that time she had not noticed any remarkable difficulty of breathing: that, at that age, she was attacked by pains in the chest, cough, and difficulty of breathing, which symptoms have re-appeared since, at different times, and rendered her quite unfit for work, for weeks together. About eight months since, she was attacked in the way just described, with greater severity than formerly; and about four months ago, still more severely; the cough and difficulty of breathing having been extreme, and much increased by slight exertion, and the expectorated matter or mucus frequently tinged with blood. She had also violent pains in the chest, back and shoulders, and particularly in the right hypochondrium, which continued until the following day, when she was bled in the arm to the amount of sixteen ounces, with much relief. Two days afterwards, she had seventeen leeches applied to the epigastrium, and took aperient medicines; about a week after which she had a blister applied to the right hypochondrium, and in about a fortnight afterwards she returned to her work, at which she continued until about a fortnight since, when, on taking cold, she was again disabled by the return of the difficulty of breathing, accompanied with pains in the left hypochondrium. She

obtained a recommendation for the Dispensary, and presented herself on the above date.

The head is free from pain or any other unpleasant symptom. She complains of pains in the chest, attended with difficulty of breathing, and coughs up small quantities of blood. The pulse is small, and 130 in a minute : she has thirst, and is feverish. She has never menstruated. The mark of vaccination exists on the arm. No œdema.

Examination of the chest.—The parietes of the chest move freely in the actions of respiration. It sounds rather more dull on the left side of the sternum, where it is also rather more prominent, than on the right side, which sounds healthy on percussion.

On the left side of the sternum, between the second and third ribs, there is a very superficial pulsation, with purring tremor, and a loud rasping souffle is heard close under the stethoscope. The pulsation does not extend further than the neighbouring parts of the chest, but the souffle is heard very extensively ; it is heard less distinctly as the stethoscope is applied further from the point mentioned, but in the situation of the heart the sound of it is sufficiently loud to mask the proper sounds of the organ ; it is heard all over the left side of the chest, even to near the vertebræ, and masks the respiratory sounds, except at the back part and the supra-clavicular region of the chest on the left side. On the right side, the souffle is heard

almost as extensively, but not with the same intensity: in connection with it, we have the respiratory sounds, which are heard more distinctly in the posterior part of the right side, where they are not interfered with by the rasping souffle described, the only situation of the chest in which there is no trace of it. Above the clavicles this anormal sound almost entirely ceases abruptly, which may be considered diagnostic of this peculiar affection, as well as that it is not heard more distinctly over the courses of the large arteries of the neck than at other parts of it.

The impulse of the heart is normal, and the space of dulness, as far as can be defined, (for there is some difficulty in defining exactly the situation of the heart by percussion, on account of the dulness on the left side of the sternum already indicated,) which marks the situation of the heart in the region, is normal.

In the upper part of the right side of the chest, the voice is heard more distinctly through the stethoscope than on the left.

The functions of the stomach, kidneys, and all other viscera not previously mentioned, are healthy.

On the 26th September she was so much improved as to go to her employment, which, through the kindness of her employer, was provided for her of that kind which she was able to do in a sitting position, thus avoiding all exertion.

This kind of attack the patient was subject to on any exposure to cold, every succeeding one being

worse than the former, and the latter attacks were accompanied by inflammation of the left lung and pleura. The remedies that were employed were antimonials, digitalis, aperients, leeches, and counter-irritants.

From the above date of her recovery, September the 26th, 1839, to the commencement of the winter 1840, she had three similar illnesses.

In December 1840 she was attacked by severe inflammation of the lungs, with great difficulty of breathing, fever, and thirst ; the pulse hard, and 140 in a minute. On examination of the chest, the pulsation was found to occupy a more extensive surface than before described, the souffle much louder, and it had decidedly assumed a see-sawing character, to which it had been gradually approaching ; marking the passage of the blood from the heart, and its regurgitation in the artery : the sounds of the heart were completely masked by it. Dulness on percussion occupied the posterior and inferior portions of the chest, and extended more particularly to the left side, under the axilla, and even anteriorly, besides the dulness on the left side of the sternum, which was noticed at the first examination, and which at this time was more extended.

Crepitation was found in all those parts of the chest just mentioned as sounding dull on percussion, except that portion to the left of the sternum previously referred to, and puerile respiration was heard over the upper parts of the left side, and more extensively over the right side of the chest.

Leechings, antimonials and blistering, somewhat relieved the patient, but not so effectually as on former occasions; this attack was much more extensive and obstinate than any former one, great emaciation and debility, with œdema of the extremities, came on, and it was very evident that she could not hold up long against so severe and repeated attacks. She improved so far as to be able to leave her bed in February, March, and the beginning of April, but there still remained very decided dulness in the inferior and lateral portions of the left side of the chest and the heart, and pulsation between the second and third ribs appeared to be closer to the surface of the chest; they were much more superficial than formerly; the see-saw souffle and purring pulsations were tremendous, and heard much more distinctly in all parts, still having the maximum at the point already indicated.

In the middle of April she again took to her bed, and died rather suddenly on the morning of the 1st of May 1841, one year and eight months after I first saw her.

Post-mortem examination, May 2nd, twenty-six hours after death.—The body is in an extreme state of emaciation, decomposition just commencing, slight discolouration at the inferior portions of the abdomen.

Head not examined.

Chest narrow. On the right side three elongated adhesions of the pleura, which is otherwise healthy.

The lung of the same side healthy, but congested with blood. On the left side, close and recent adhesions of the pleura in the upper half, the lower half contains about a pint and a half of purulent fluid. The lung at the same side is compressed and semi-carnified in its inferior portion, and very much congested superiorly. The bronchial mucous membrane is deeper coloured than natural generally.

The pericardium is healthy, and contains about its usual quantity of fluid.

The heart* is about twice its ordinary size, its parietes are of their natural thickness, and maintain their relative proportions, the dilatation is equal in all the cavities, which all contain yellowish coagula, some portions of which are so hard and firm as to do away with the possibility of considering them as entirely *post-mortem* formations.

The right auricle, with the exception of the dilatation and hypertrophy already spoken of, (which must also be taken into account, in addition to what is stated in the following description of the other cavities,) is perfectly normal.

The tricuspid valves are healthy. The auriculo-ventricular aperture is dilated, so as to render the valves somewhat ineffective in their action.

In the right ventricle, the columnæ carneæ are thicker than normal. The orifice of communication with the pulmonary artery is considerably dilated; within, or immediately below the opening, is the orifice of a communication with the left ventricle,

* See Plate VII.

which measures about a third of an inch across, and the eighth of an inch from above, downwards. The two anterior semilunar valves are perfect, of the normal size, but considerably thickened; the posterior one is imperfect, being so narrow and constricted in its middle portion, as to be a mere band-like projection from the artery: it is just underneath this portion of the valve that the anormal opening of communication with the left ventricle is situated. The pulmonary artery is much dilated, it measures five inches and three quarters in its greatest circumference, (internal measure,) and in its anterior portion is a considerable thinning of its coats. From the valves and internal coat of the artery arise numerous polypi, attached by very thin pedicles, one of which arises at the upper part of the anormal orifice of communication with the left ventricle, and passes into the canal, as if it had been so placed by the current of blood flowing from the right to the left ventricle through the aperture, and in this position it may have acted as an obstacle to prevent the flow of blood from the left to the right side of the heart. The branches of the pulmonary artery are considerably dilated. The opening of the ductus arteriosus into the pulmonary artery is contracted into a punctum, into which a hog's bristle is passed, without any violence, and easily made to traverse the canal of the duct up to its communication with the aorta, where it is obstructed by a membrane, so thin and transparent, that the dark colour of the bristle is seen through it. An irregular-shaped

portion of fibrine, about an inch and a half long and three parts of an inch broad, is situated in the anterior part of the dilated pulmonary artery, closely in apposition with the thinned portion of its coats, intimately attached to the polypi arising from this part of the artery and anterior semilunar valve, and seems to have been entangled by them.

The left auricle is healthy otherwise than the dilatation and hypertrophy. The Eustachian valve is perfectly closed.

The auriculo-ventricular opening is dilated, the mitral valve is normal in its structure, but not sufficient to close the dilated opening perfectly.

In the left ventricle the columnæ carneæ are thicker than normal: at the base of this cavity is seen, in addition to the usual apertures, the anormal opening of communication with the right ventricle, situated rather anteriorly to, and just below the orifice of the aorta. It is here of a rounded triangular shape, and the free end of the polypus, already described as being placed in the passage, is seen hanging into the left ventricle.

The opening of the aorta is rather dilated, and closely in connection with the mitral valve is a patch of ossification. The semilunar valves are normal, but, from the dilatation of the artery, must be considered as scarcely effective. The ascending aorta is dilated about half beyond its normal size; the distribution of the arteries from its arch may be considered as divisions of the artery, rather than as the giving off of branches, maintaining very much the

congenital disposition of this portion of the circulation. The artery loses a third of its capacity in giving off the *arteria innominata*, a sixth in giving off the left carotid, and another sixth in giving off the left subclavian, and is then contracted to about the third of its capacity in the ascending portion, and the coats of the artery are thinned in this situation, much more than in proportion to the diminution of its capacity. This contraction extends from the root of the left subclavian to the joining with the *ductus arteriosus*, where the whole circumference of the artery is still further contracted by a hardened, somewhat cartilaginous thickening of the coats, projecting equally on all sides into its interior to such an extent, as to contract the capacity of the artery again to about a third. So that, at this point, the capacity of the artery is not more than a ninth of what it is in its ascending portion. Just on the distal side of the annular constriction is the communication with the *ductus arteriosus*, closed by a thin, transparent membrane, and immediately below it the artery is dilated to the usual size of the ascending aorta.

All the organs of the digestive apparatus are healthy except the liver, which is enlarged to about three times its normal size, and much congested in its venous hepatic system of vessels.

The kidneys and urinary organs are healthy.

The uterus, ovaries and organs of the genital system are not more developed than is usually found at eleven or twelve years of age, or before puberty.

There is a point to which the perusal of the excellent paper of Dr. Cr^Lagie, in the Edinburgh Medical and Surgical Journal for October 1841, on the obliteration of the aorta, has called my attention, namely, the state of the collateral vessels, by which circulation must have been carried on, and the only excuse to be offered for such an important point having been omitted in the *post-mortem* examination is, that the obliteration in question in this preparation was not discovered until after it had been taken from the body, and, indeed, after the body was buried. But I well remember remarking the extraordinary size of the internal mammary arteries: and, as may be seen by the preparation, the ascending aorta and the vessels given off from the arch are considerably dilated. The intercostals were also larger than normal, thus showing that we have sufficient evidence of collateral circulation having been in some degree established.

There is a remark of Dr. Cr^Lagie which this preparation does not bear out, namely, that "the obliteration takes place at a definite point of the artery, namely, at or immediately below that part where the ductus arteriosus, converted into a ligament, joins the descending part of the arch of the aorta."

In this preparation, the obliteration is at or immediately above the part where the ductus arteriosus joins the aorta, and I think it is very probable that Dr. Cr^Lagie was led to make the statement in question, from not having paid attention to the

obliquity of the union of the ductus arteriosus with the aorta, which, in fact, opens into the canal of the aorta, much below its external apparent union, which is distinctly seen in this preparation, from the canal of the ductus arteriosus having remained sufficiently pervious to allow a bristle to be passed along it.

The other case I present to the Society is one of Cyanosis, in which there is total absence of the septum of the auricles, contraction at the origin of the aorta, shortening of the septum of the ventricles in its upper portion, and general hypertrophy of the heart.

George Ollet, aged 21, a shoemaker, presented himself as a patient at the General Dispensary, Birmingham, April 13th, 1839, suffering from distressing difficulty of breathing, palpitations of the heart, general anasarca, and a blue state of the skin, more especially of the lips, face, hands and genitals; which was increased on coughing or any exertion; a bad cough and expectoration of mucus. His skin was much below the usual temperature: a Fahrenheit's thermometer placed in the axilla or in the mouth did not stand higher than 80 degrees.

On examining the chest by percussion, the dullness of the precordial region was much larger than usual, the pulmonary sound somewhat duller than normal generally over the chest, but more especially on the right side. On auscultation a mucous rattle was heard all over the right side, and in the larger bronchial tubes on the left side of the chest. The

impulse of the heart was much greater than normal, and a *bruit de soufflet*, beginning with the first sound of the heart, and sufficiently long to mask the second sound, was heard, in its greatest intensity, underneath the middle bone of the sternum.

He said that, as long as he could recollect, his skin had been of the same colour, that he had always been much affected by cold, and frequently in severe weather he had fallen down senseless in the street, and had been revived by warmth and friction ; he is very subject to faintings. On taking cold he always suffers in the same way as at present, but not often so badly : when comparatively in health he has neither œdema nor cough, but at all times he is subject to palpitations and difficulty of breathing on any exertion, and always feels languid and feeble. His virile powers are very low ; he never feels any inclination towards the other sex ; there are very few hairs on the pubes ; he has neither beard nor whiskers ; his testicles are very small ; the state of puberty is not developed.

By mercurials, diuretics, and blistering the chest, the cough, expectoration and anasarca subsided in about three weeks, when he expressed himself as feeling in his usual state of health. I directed him to take plentifully of bitartrate of potash in his drinks, observe rest as much as possible, avoid cold, and regulate his diet. He went on pretty well for some months, working at his trade at his own house.

In the autumn of the same year I found him

suffering in a similar way to that just described, and this attack subsided in about the same time and under the use of the same remedies as the former.

On the 13th of December 1839, I was again called to my patient, and found him in a much worse state than I had seen him before: he had been ill more than a week; remedies were of no avail; and he died on the 15th.

His exhaustion and debility were such that I did not have him bled, a remedy highly spoken of by M. Bouilland in cyanosis, and which in this case might have been beneficial, I think, from the immense quantity of blood found about the heart and large veins after death.

*Post-mortem examination on the morning of the 17th,
forty hours after death.*

Head not examined.

Chest: Pleuræ free from adhesions, no fluid in their cavities.

Lungs generally much congested with blood. The mucous membranes of the bronchi red, and much loaded with mucus.

The heart and large veins enormously distended with dark-coloured blood. I have never seen them nearly so much so. The heart much enlarged and hypertrophied. The septum of the auricles so totally absent as to convert the cavities into one: the veins of the general circulation enter it on the right of a line drawn in the normal situation of the septum, and the pulmonary veins on the

left of it. The auriculo-ventricular openings are large, and between them the septum of the ventricles is much notched out. The orifice of the aorta is contracted to a third of its usual capacity, and its semilunar valves are diseased and ineffective.

Abdomen: The liver much congested in its venous hepatic system, and enlarged about a third more than its normal size. The other viscera of this cavity as well as of the pelvis are healthy.

Description of the Heart and large Vessels of Mary Bunn, as shown in Plate VII.

- A—Right ventricle.
- B—Anormal communication with the left ventricle.
- c—The two anterior semilunar valves.
- D—The posterior valve—its constricted state.
- E—Pulmonary artery, greatly dilated.
- F—Numerous polypi, attached by very thin pedicles.
- G—The polypus passing into the canal of communication with the left ventricle.
- H—An irregular-shaped portion of fibrine, situated in the anterior part of the dilated pulmonary artery, close to the thinned portion of its coats.
- I—Apex of the right auricle. J—Left ventricle.
- K—Probe passed from the left to the right ventricle, through the anormal opening.
- L—Ascending aorta, dilated. M—Arteria innominata.
- N—Left carotid. o—Left subclavian.
- P—Contracted and thinned portion of the aorta.
- Q—Portion contracted by a cartilaginous projection of the coats of the artery internally.
- R—Descending aorta. S—Ductus arteriosus.



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